

Long Life 600W Hall Thruster System for Radioisotope Electric Propulsion, Phase I

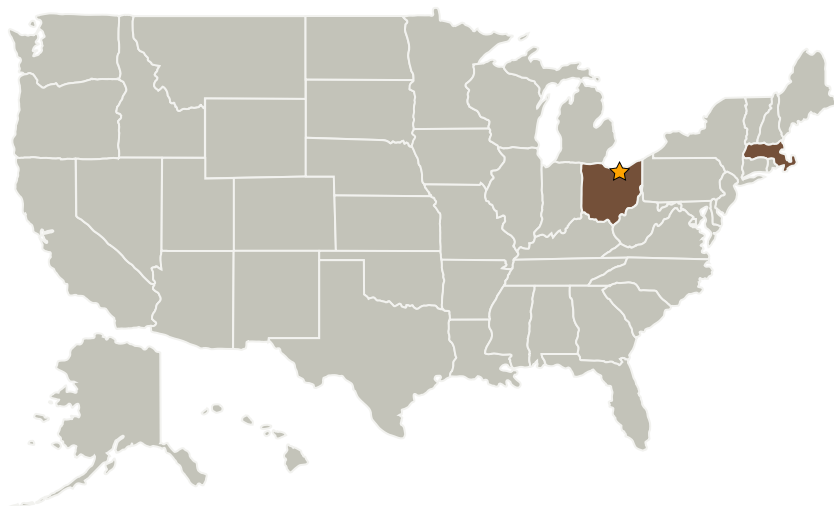
Completed Technology Project (2009 - 2009)



Project Introduction

Radioisotope Electric Propulsion (REP) offers the prospect for a variety of new science missions by enabling use of Hall Effect propulsion in the outer solar system, particularly at distances beyond the limits of practical solar photovoltaic power. Radioisotope Power System (RPS) technology under development by the Science Mission Directorate (SMD) provides high system-specific power and lifetime needed for REP applications. The low power (0.5 to 1.0 kW) and multiyear (30,000 hour) lifetime HET systems needed for these missions will be addressed in the proposed multi-phase effort. The project leverages a long life 600 W Hall thruster currently under development by Busek as part of the 2007 Innovative Partnership Program based on an innovative life-extending technology developed under SMD In-Space Propulsion Technology (ISPT) project by the NASA Glenn Research Center. In Phase I we will evaluate system level needs to meet REP mission requirements. The life time of the existing cathode will be determined by a combination of experimental and numerical methods. A methodology and algorithms for sensing and suppressing thruster discharge current oscillations will be incorporated into the thruster control system. An integrated system demonstration that includes the thruster life extension technology will be performed.

Primary U.S. Work Locations and Key Partners



Long Life 600W Hall Thruster System for Radioisotope Electric Propulsion, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Long Life 600W Hall Thruster System for Radioisotope Electric Propulsion, Phase I

Completed Technology Project (2009 - 2009)



Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Busek Company, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Natick, Massachusetts

Primary U.S. Work Locations

Massachusetts	Ohio
---------------	------

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.2 Electric Space Propulsion
 - └ TX01.2.2 Electrostatic